



DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 29

[Docket No. FAA-2021-1143; Notice No. 29-21-01-SC]

Special Conditions: Airbus Helicopters Model H160B Helicopter; Extended Duration of Flight after Loss of Main Gearbox Lubrication

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Notification of proposed special conditions.

SUMMARY: This action proposes special conditions for the Airbus Helicopters (Airbus) Model H160B helicopter. This helicopter will have a novel or unusual design feature when compared to the state of technology envisioned in the airworthiness standards for helicopters. This design feature is the extended duration of safe flight beyond 30 minutes after the loss of main gearbox lubrication. The applicable airworthiness regulations do not contain adequate or appropriate safety standards for this design feature. These proposed special conditions contain the additional safety standards that the Administrator considers necessary to establish a level of safety equivalent to that established by the existing airworthiness standards.

DATES: Send comments on or before **[INSERT DATE 45 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**.

ADDRESSES: Send comments identified by docket number FAA-2021-1143 using any of the following methods:

Federal eRegulations Portal: Go to <https://www.regulations.gov/> and follow the online instructions for sending your comments electronically.

Mail: Send comments to Docket Operations, M-30, U.S. Department of Transportation (DOT), 1200 New Jersey Avenue, SE, Room W12-140, West Building Ground Floor, Washington, DC, 20590-0001.

Hand Delivery or Courier: Take comments to Docket Operations in Room W12-140 of the West Building Ground Floor at 1200 New Jersey Avenue, SE, Washington, DC, between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays.

Fax: Fax comments to Docket Operations at (202) 493-2251.

Docket: Background documents or comments received may be read at <http://www.regulations.gov/> at any time. Follow the online instructions for accessing the docket or go to Docket Operations in Room W12-140 of the West Building Ground Floor at 1200 New Jersey Avenue, SE, Washington, DC, between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays.

FOR FURTHER INFORMATION CONTACT: Kamron Dowlatbadi, Mechanical Systems, AIR-623, Technical Policy Branch, Policy and Standards Division, Aircraft Certification Service, 10101 Hillwood Parkway, Fort Worth, TX, 76177; telephone (817) 222-5219; email Kamron.M.Dowlatbadi@faa.gov.

SUPPLEMENTARY INFORMATION:

Comments Invited

The FAA invites interested people to take part in this rulemaking by sending written comments, data, or views. The most helpful comments reference a specific portion of the special conditions, explain the reason for any recommended change, and include supporting data.

The FAA will consider all comments received by the closing date for comments, and will consider comments filed late if it is possible to do so without incurring delay. The FAA may change these special conditions based on the comments received.

Privacy

Except for Confidential Business Information (CBI) as described in the following paragraph, and other information as described in title 14, Code of Federal Regulations (14 CFR) 11.35, the FAA will post all comments it receives, without change, to <https://www.regulations.gov/>, including any personal information the commenter provides. The

FAA will also post a report summarizing each substantive verbal contact received about these special conditions.

Confidential Business Information:

CBI is commercial or financial information that is both customarily and actually treated as private by its owner. Under the Freedom of Information Act (FOIA) (5 U.S.C. 552), CBI is exempt from public disclosure. If your comments responsive to these proposed special conditions contain commercial or financial information that is customarily treated as private, that you actually treat as private, and that is relevant or responsive to these proposed special conditions, it is important that you clearly designate the submitted comments as CBI. Please mark each page of your submission containing CBI as “PROPIN.” The FAA will treat such marked submissions as confidential under the FOIA, and the indicated comments will not be placed in the public docket of these proposed special conditions. Send submissions containing CBI to the individual listed in the **FOR FURTHER INFORMATION CONTACT** section. Comments the FAA receives, which are not specifically designated as CBI will be placed in the public docket for this rulemaking.

Background

On November 7, 2014, Airbus applied for FAA type certification for the Model H160B helicopter. On November 1, 2016, Airbus applied for an extension, which is also the date of the updated type certification basis.

The Airbus Model H160B helicopter is a 14 CFR part 29 transport-category, twin-turboshaft-engine helicopter. This helicopter has a maximum takeoff weight of 13,436 lbs. with seating for 12 passengers and 2 crewmembers. The Airbus Model H160B helicopter is a new part 29 helicopter characterized by the integration of composite materials in its airframe, five main rotor blades (Blue Edge™ technology), a Fenestron™ tail rotor, and a Helionix™ avionics suite.

Type Certification Basis

Under the provisions of 14 CFR 21.17, Airbus must show that the Model H160B helicopter meets the applicable provisions of part 29 as amended by amendments 29-1 through 29-55. The date of the Airbus Model H160B helicopter type certification basis is November 1, 2016.

If the Administrator finds that the applicable airworthiness regulations (i.e., 14 CFR part 29) do not contain adequate or appropriate safety standards for the Airbus Model H160B helicopter because of a novel or unusual design feature, special conditions are prescribed under the provisions of § 21.16.

Special conditions are initially applicable to the model for which they are issued. Should the type certificate for that model be amended later to include any other model that incorporates the same or similar novel or unusual design feature, the special conditions would also apply to the other model under § 21.101.

In addition to the applicable airworthiness regulations and special conditions, the Airbus Model H160B helicopter must comply with the noise certification requirements of 14 CFR part 36.

The FAA issues special conditions, as defined in 14 CFR 11.19, in accordance with § 11.38, and they become part of the type-certification basis under § 21.17(a)(2).

Novel or Unusual Design Feature

The Airbus Model H160B helicopter will incorporate the following novel or unusual design feature:

Extended duration of safe flight beyond 30 minutes after indication to the crew of the loss of main gearbox lubrication.

Discussion

Current regulations do not prescribe a duration for continued safe flight and landing to be specifically called out in the rotorcraft flight manual when a loss of main gearbox lubrication warning is activated. Although § 29.927(c)(1) requires a loss of main gearbox lubrication bench

test for 30 minutes to show that the main gearbox is operational for 30 minutes following a loss of main gearbox lubrication event, the bench test conditions may not be representative of aircraft flight conditions because a 30-minute main gearbox bench test may not translate to 30 minutes of continued safe flight and landing.

The novel or unusual design feature of the Airbus Model H160B helicopter is intended to enable the helicopter to continue safe flight, for a minimum of 30 minutes, to the intended destination or to a safe landing location after the loss of main gearbox lubrication. To meet this minimum 30 minutes of continued safe flight, the Airbus Model H160B helicopter main gearbox is designed with a redundant lubrication system. This main gearbox redundant lubrication system would allow operation after the failure of a single lubrication system. Current regulations do not address a redundant lubrication system that allows operation after the failure of a single lubrication system because at the time the existing regulations were issued, the agency did not envision that a flight duration of more than 30 minutes, after the loss of main gearbox lubrication, was needed. Accordingly, these proposed special conditions would provide testing criteria to ensure the reliability of the redundant lubrication system to provide safe flight beyond 30 minutes after annunciation of the loss of the main gearbox lubrication.

These proposed special conditions would add requirements in lieu of the existing airworthiness standards in § 29.917(a) and (c), and would add a new requirement to § 29.1585.

The FAA did not envision the standards for the lubrication system components to be a critical failure point at the time of the issuance of the existing regulations, and the standards were not included in the design assessment of the drive system. Accordingly, these proposed special conditions would include “any associated lubrication system components including oil coolers.”

These proposed special conditions would add a safety margin over the current 30-minute main gearbox bench test by requiring a test duration of more than 30 minutes to ensure that the rotor-drive gearbox system has an in-flight operational endurance capability of at least 30 minutes following a failure of any one pressurized, normal-use lubrication system. The 30-

minute test interval starts when the lubrication-failure indication to the flight crew is triggered and the engine is at maximum continuous power. These proposed special conditions would require a bench test of the main gearbox for at least 60 minutes in some cases, depending on reduction factors, which are applied to correlate the test duration with the maximum period of in-flight operation following loss of lubrication, and to ensure that the main gearbox operates for 30 minutes after a loss-of-lubrication situation.

The degree of confidence specified in Category A and B in these proposed special conditions would require the applicant to establish a reduction factor to correlate the test duration with the maximum period of in-flight operation following loss of lubrication. The factor assigned by the applicant is directly dependent on the availability of supporting data with respect to the mechanical behavior of the gearbox, and must reflect the applicant's confidence in the repeatability of the certification test data. Test loading, in the context of these special conditions, refers to the engine, gearbox, clutch system, and rotors (or similar test apparatus) interconnected and operating in unison, as this combination of mechanical elements pertains to power input transmitted to the gearbox and subsequent reaction torques simulating operating conditions.

These proposed special conditions would add a requirement that the maximum duration of operation after a failure, which results in a loss of main gearbox lubrication and an associated oil pressure warning, must be furnished in the rotorcraft flight manual, a duration that must not exceed the maximum period substantiated.

Applicability

As discussed above, these proposed special conditions would be applicable to the Airbus Model H160B helicopter. Should Airbus apply at a later date for a change to the type certificate to include another model incorporating the same novel or unusual design feature, these special conditions would apply to that model as well.

Conclusion

This action affects only a certain novel or unusual design feature on one model of helicopter. It is not a rule of general applicability.

List of Subjects in 14 CFR Part 29

Aircraft, Aviation safety, Reporting and recordkeeping requirements.

Authority Citation

The authority citation for these special conditions is as follows:

Authority: 49 U.S.C. 106(f), 106(g), 40113, 44701-44702, 44704.

The Proposed Special Conditions

Accordingly, the Federal Aviation Administration (FAA) proposes the following special conditions as part of the type certification basis for the Airbus Helicopters Model H160B helicopter. Unless stated otherwise, all requirements in §§ 29.917, 29.927, and 29.1585 would still apply.

In lieu of § 29.917(a), the following special condition applies:

(a) *Design: General.* The rotor-drive gearbox system includes any part necessary to transmit power from the engines to the rotor hubs. This includes gearboxes, shafting, universal joints, couplings, rotor-brake assemblies, clutches, supporting bearings for shafting, any attendant accessory pads or drives, any cooling fans, and any associated lubrication-system components including oil coolers that are a part of, attached to, or mounted on the rotor-drive gearbox system.

In lieu of § 29.927(c), the following special condition applies:

(c) *Lubrication system failure.* For rotor-drive gearbox systems featuring a pressurized normal-use lubrication system, the following requirements for continued safe flight and landing apply:

(1) *Category A.* Confidence must be established that the rotor-drive gearbox system has an in-flight operational endurance capability of at least 30 minutes following a failure of any one pressurized, normal-use lubrication system.

(i) For each rotor-drive gearbox system necessary for continued safe flight or safe landing, the applicant must conduct a test that simulates the effect of the most severe failure mode of the normal-use lubrication system, as determined by the failure analysis of § 29.917(b). The duration of the test must be dependent on the number of tests and the component condition after each test.

(ii) The test must begin when the indication to the flight crew shows a lubrication failure has occurred, and its loading must be consistent with 1 minute at maximum continuous power, followed by the minimum power needed for continued flight at the rotorcraft maximum gross weight.

(iii) The test must end with a 45-second out-of-ground-effect (OGE) hover to simulate a landing phase. Test results must substantiate the maximum period of operation following a loss of lubrication by means of an extended test duration or multiple test specimens, or another approach prescribed by the applicant and accepted by the FAA.

(2) *Category B.* Confidence must be established that the rotor-drive gearbox system has an in-flight operational endurance capability to complete an autorotation descent and landing following a failure of any one pressurized, normal-use lubrication system.

(i) For each rotor-drive gearbox system necessary for safe autorotation descent or safe landing, the applicant must conduct a test of at least 16 minutes and 15 seconds, following the most severe failure mode of the normal-use lubrication system, as determined by the failure analysis of § 29.917(b).

(ii) The test must begin when the indication to the flight crew shows that a lubrication failure has occurred, and its loading must be consistent with 1 minute at maximum continuous power. Thereafter, the input torque should be reduced to simulate autorotation for a minimum of 15 minutes.

(iii) The test must be conducted using an input torque to simulate a minimum power landing for approximately 15 seconds.

In addition to § 29.1585, the following special condition applies:

(h) *Power Plant limitations*. The maximum duration of operation after a failure, resulting in any loss of lubrication of a rotor-drive-system gearbox and an associated oil-pressure warning, must be furnished in the rotorcraft flight manual, and must not exceed the maximum period substantiated in accordance with § 29.927(c) of these special conditions.

Issued in Des Moines, Washington on May 8, 2023.

Suzanne A. Masterson,
Acting Manager, Technical Policy Branch,
Policy and Standards Division,
Aircraft Certification Service.
[FR Doc. 2023-10135 Filed: 5/11/2023 8:45 am; Publication Date: 5/12/2023]